REMARKS

Claims 1-4, 6-13 and 15 are now pending in the application. Claims 1 and 4 have been amended. Support for the foregoing amendments can be found throughout the specification, drawings, and claims as originally filed. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 103

Claims 1-4, 6-13 and 15 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen et al. (U.S. Pub. No. 2004/0165592) in view of Silverman (U.S. Pat. No. 6,731,649). This rejection is respectfully traversed.

Claim 1, as amended, recites:

A method for providing service with guaranteed Quality of Service (QoS) in IP access networks, each of the IP access networks comprises an edge router connected to a backbone network, and an access network end device connected to subscribers, comprising:
a1.   a calling subscriber sending a request to a service entity when the calling subscriber wants to use a service with guaranteed QoS;
a.   the service entity at network service control layer judging service rights of the calling subscriber after receiving the request, obtaining a calling subscriber address and a called subscriber address, and determining QoS requirement for the service, then sending a resource request to an edge router to request resources;
b.   the edge router corresponding to the calling subscriber and a called subscriber computing bandwidth between a access network end device and the edge router after receiving the resource request <u>and determining whether there are enough resources for this service according to topology structure of the IP access network and bandwidth resources of each interface of the IP access network</u>, if there are enough resources, executing c., otherwise rejecting the service request of the calling subscriber; and
c.   if there is an upward traffic stream sent from one of the calling subscriber and the called subscriber to the corresponding IP access network for this service, the corresponding edge router informing the

corresponding access network end device of the QoS requirement for the service, and the corresponding access network end device setting items of a stream classification table according to parameters for identifying the upward traffic stream contained in the QoS requirement; classifying the upward traffic stream sent from one of the calling subscriber and the called subscriber; and performing bandwidth limitation according to bandwidth parameters in the QoS requirement informed by the corresponding edge router for the upward traffic stream when matched with the items of the stream classification table, and processing the upward traffic stream when not matched as an upward traffic stream without guaranteed QoS;

If there is a downward traffic stream to be sent to one of the calling subscriber and the called subscriber from the corresponding IP access network for this service, the corresponding edge router setting priority in the corresponding IP access network for this service and forwarding the downward traffic stream to the corresponding subscriber according to the priority set by the corresponding edge router.

The Examiner asserts that paragraphs 19, 30 and 94 of Chen disclose the feature of "the service entity at network service control layer determining QoS requirement for the service." Applicants respectfully traverse the Examiner's assertion.

Paragraph 19 of Chen at best shows that a minimum number of contiguous data VCs and control needed to support the QoS may be determined. But it does not show which entity determines the QoS requirement.

Paragraph 30 of Chen merely shows an example of when a subscriber 10 might desire such a QoS connection: e.g. when the subscriber 10 desires to engage in a video conference with another subscriber 40. Paragraph 30 merely shows that the subscriber 10 dynamically selects a peer device when the subscriber 10 desires to engage in a video conference and the QoS connection is established between the subscriber 10 and the peer subscriber 40. Paragraph 30 of Chen also does not mention which party determines the QoS requirement.

Paragraph 94 of Chen shows that once the source subscriber 10 has retrieved the AESA, it initiates a connection with the ATM network 16 by sending a signaling message, such as a setup connection request, to the ATU-R 12 at step 514. In an embodiment of the invention, the QoS application sends a QoS connection setup message through the API to the ATU-R. The setup message carries the service category, the traffic descriptors and the QoS parameter. In an alternative embodiment, the QoS application sends the QoS connection setup message through the API to a network service agent (not pictured in FIG. 5), such as the network service agent 102 of FIG. 2. The network service agent translates the connection setup message and forwards it to an SVC signaling entity in the ATU-R 12. The signaling message also includes the AESA of the destination subscriber 40, as well as the QoS requirement for supporting the underlying application.

In view of the above, paragraph 94 of Chen at best shows that the QoS application sends the QoS connection setup message carrying the QoS parameter to the ATU-R or the network service agent. The network service agent merely translates the QoS parameter into the QoS requirement in the signaling message. Thus, paragraph 94 of Chen does not teach or suggest the feature of "the service entity at network service control layer determining QoS requirement for the service."

The Examiner asserts that paragraphs 96, 97 and 106 of Chen disclose the feature of "the edge router corresponding to the calling subscriber and a called subscriber computing bandwidth between a access network end device and the edge router after receiving the resource request". Applicants respectfully traverse the Examiner's assertion.

Paragraph 96 shows that the ATM switch determines whether there is enough available or equivalent bandwidth to accommodate the new connection. Paragraph 97 shows that the ATM switch determines if it can satisfy the requirement of connection based on traffic descriptor. Paragraph 106 shows that a policy is imposed on each connection based on the traffic descriptor.

In view of the above paragraphs cited by the Examiner, Chen at best shows that the ATM switch determines whether there is enough bandwidth to accommodate the new connection. But Chen does not disclose determination performed based on the topology structure of the IP access network and bandwidth resources of each interface of the IP access network (as recited in claim 1). Further, as described in paragraph 106 of Chen, the policy at best refers to billing, etc. Chen does not mention the topology structure of the IP access network and bandwidth resources of each interface of the IP access network.

Thus, Chen does not teach or suggest the feature of "the edge router corresponding to the calling subscriber and a called subscriber determining whether there are enough resources for this service according to topology structure of the IP access network and bandwidth resources of each interface of the IP access network."

The Examiner asserts that paragraphs 35, 39, 97, 98 and 106 of Chen disclose the feature of "the corresponding access network end device performing bandwidth limitation according to bandwidth parameters in the QoS requirement informed by the corresponding edge router for the upward traffic stream when matched with the items of the stream classification table." Applicants respectfully traverse the Examiner's assertion.

As stated by the Examiner, in paragraph 35 Chen, it is the connection server 25 that performs a call admission control (CAC) step to determine if sufficient available bandwidth exists in the ATU-Rs and DSLAMs to accommodate the connection request. Paragraph 39 of Chen shows transmitting the traffic packets from the source subscriber 10 over either the new QoS connection or the default route to the ISP, based upon whether or not the packet originates from an application associated with the new QoS connection. Paragraph 97 of Chen shows that the ATM switch 15 also performs a connection CAC to determine whether any of the pre-configured PVCs in the DSLAM 14 for this subscriber can satisfy the requirement of the connection based on traffic descriptors and QoS requirements. Paragraph 0098 of Chen shows that the ATM switch responds to the ATU-R 12 with a CALL-PROCEED message at step 517 to indicate initiation of the requested connection at the QoS requirement. Paragraph 106 of Chen shows that policing may be imposed on each connection based on the traffic descriptors.

First, in claim 1, it is the access network end device that performs the bandwidth limitation according to bandwidth parameters in the QoS requirement informed by the corresponding edge router for the upward traffic stream when matched with the items of the stream classification table. The Examiner asserts that the ATM switch performing the CAC of Chen is analogous to the access network end device performing the bandwidth limitation of claim 1. The Examiner, however, also asserts at page 4 of the outstanding Office action that the ATM switch is analogous to the edge router. This appears inconsistent. The ATM switch can not be considered to be analogous to the access network end device and the edge router at the same time. As stated on page 3

of the first Office action after the first RCE issued on September 10, 2008, the Examiner asserted that the <u>connection server 25 of Chen is analogous to the service entity</u>. Thus, asserting <u>the connection server 25 as also analogous to the access network end device is inconsistent</u>.

Therefore, the above paragraphs cited by the Examiner do not teach or suggest the features of "the <u>corresponding access network end device</u> performing...."

Second, in claim 1, the bandwidth limitation is performed for the upward traffic stream <u>after</u> the edge router determines that there are enough resources between the access network end subscriber and the edge router and <u>after</u> the upward traffic stream is received from one of the calling subscriber and the called subscriber. In addition, the bandwidth limitation is performed during the upward traffic stream is transmitted.

In contrast, paragraph 35 of Chen at best shows that the connection server 25 performs the CAC <u>after receiving the connection request</u>, i.e. <u>before</u> the QoS connection is established. Since the QoS connection has not been established, the CAC can <u>not</u> be performed on the traffic packets transmitted through the established QoS connection.

One skilled in the art would appreciate that the bandwidth limitation for the upward traffic stream refers to <u>limiting the bandwidth of the upward traffic stream</u> according to the bandwidth parameters in the QoS requirement. Paragraph 39 of Chen at best shows transmitting the traffic packets over the QoS connection or the default route, but does not mention the bandwidth limitation for the upward traffic stream. Claim 1 requires performing bandwidth limitation for the <u>upward traffic stream repeatedly during the transmission of the upward traffic stream</u>. In contrast, <u>the CAC in</u>

Chen is just performed once, i.e. performed before the establishment of the QoS connection.

Similar, paragraph 97 of Chen also refers to performing a standard ATM UNI CAC and an Extended Virtual UNI CAC to determine whether there is enough available or equivalent bandwidth to accommodate the new connection. That is to say, paragraph 97 also at best shows the CAC before the establishment of the QoS connection.

Paragraph 98 of Chen at best shows indicating initiation of the requested connection at the QoS requirement, but does not mention bandwidth limitation for the upward traffic stream.

Paragraph 106 of Chen at best shows imposing policing, such as billing, on each connection based on the traffic descriptors. Paragraph 106 also does not mention limiting the bandwidth of the upward traffic stream by the access network end device.

In view of the above, the CAC performed in Chen differs from the bandwidth limitation as recited in claim 1.

Thus, Chen does not teach or suggest the features of "the corresponding access network end device performing bandwidth limitation according to bandwidth parameters in the QoS requirement informed by the corresponding edge router for the upward traffic stream when matched with the items of the stream classification table."

Further, Silverman fails to cure the deficiencies of Chen, because Silverman appear silent about the above mentioned distinguishing features of claim 1. Thus, Chen and Silverman, taken alone or together, do not teach or suggest the subject matter of

claim 1. Applicants submit that claim 1 and its dependent claims 2-4, 6-13 and 15 define over the art cited by the Examiner.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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